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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/098,714	03/15/2002	Kevin D. MacLean	NMTC-0770	3043
30185 7590 07/31/2007 NUMERICAL TECHNOLOGIES, INC. C/O PARK, VAUGHAN & FLEMING LLP 2820 FIFTH STREET DAVIS, CA 95618-7759			EXAMINER ALHIJA, SAIF A	
			ART UNIT 2128	PAPER NUMBER
			MAIL DATE 07/31/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/098,714

Applicant(s)

MACLEAN ET AL.

Examiner

Saif A. Alhija

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. Claims 1-35 have been presented for examination.

**Response to Arguments**

2. Applicant's arguments filed 26 April 2007 have been fully considered but they are not persuasive.

- i) Applicant argues the 112 2<sup>nd</sup> rejection of the term "similar." Applicants attempt to import limitations from the specification with respect to the definition of the term "similar." Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further, Applicants have stated that the term "similar" may be considered indefinite. When taken in its broadest most reasonable context the term "similar" is indefinite and therefore the rejection is maintained below.

- ii) Applicant argues that Cobb does not disclose, "using the previously calculated solution for the preceding cell as an initial input to the iterative process for the target cell." At the very least the reference is functionally equivalent to the approach argued by Applicants. First, Applicants have provided no specificity with regards to the iterative process discussed in the claims. Assuming that the iterative process ends after a single iteration then the reference anticipates the claimed invention. For example, the reference teaches the reuse of a previously calculated solution and the claim states using the previously calculated solution as an initial input. There is no need for the claimed limitations to iterate numerous times but rather as claimed to iterate until the solution complies with a tolerance, which can be a single step, which as previously stated is anticipated by the reference. Second, the end result of both recitations would result in a solution for a cell that would be identical. Applicants have suggested on page 14 of their response that the system disclosed by Cobb would allow for imperfect or suboptimal OPC to be propagated to other equivalent areas. However the reference teaches a post processor correction step, which would alleviate errors in the previously calculated solution as suggested by Applicants.

- iii) Examiner has cited particular columns and line numbers in the references applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as

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potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

iv) The Examiner respectfully requests, in the event the Applicants choose to amend or add new claims, that such claims and their limitations be directly mapped to the specification, which provides support for the subject matter. This will assist in expediting compact prosecution.

v) Further, the Examiner respectfully encourages Applicants to direct the specificity of their response with regards to this office action to the broadest reasonable interpretation of the claims as presented. This will avoid issues that would delay prosecution such as limitations not explicitly presented in the claims, intended use statements that carry no patentable weight, mere allegations of patentability, and novelty that is not clearly expressed.

**Claim Rejections - 35 USC § 112**

**The following is a quotation of the second paragraph of 35 U.S.C. 112:**

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**3. Claims 1-35 are rejected** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i) The claims recite the term “similar” which is vague and indefinite. The specification mentions several definitions of the term similar, which reinforces this position. Further, claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appropriate correction is required.

All claims dependent upon a rejected base claim are rejected by virtue of their dependency.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-35 are rejected** under 35 U.S.C. 102(b) as being clearly anticipated by Cobb “Streamlined IC Mask Layout Optical and Process Correction Through Correction Reuse”, WO 00/67074 A1, hereafter referred to as Cobb.

**Regarding Claim 1:**

Cobb discloses A method for speeding up an iterative process that simulates and corrects a layout of a target cell within an integrated circuit, the method comprising:

determining if the target cell is similar to a preceding cell for which there exists a previously calculated solution; (Page 6, Paragraph 2, Analyzer Figure 1, element 109, Equivalency Analyzer. Figure 5, Element 506)

if the target cell is similar to the preceding cell, using the previously calculated solution for the preceding cell as an initial input to the iterative process for the target cell; (Page 8, Paragraph 2, OPC Equivalent. Figure 5, Element 508)

otherwise using the layout of the target cell as the initial input to the iterative process for the target cell; (Figure 5, Element 510, 512, and 514) and

performing the iterative process on the layout of the target cell or the previously calculated solution to produce the solution for the target cell, wherein the difference between the solution and a desired layout for the target cell is less than a pre-specified tolerance. (Page 8, Paragraph 3, Iteration for correction determination)

**Regarding Claim 2:**

Cobb discloses The method of claim 1, wherein the target cell is similar to the preceding cell if the layout of the target cell matches the layout of the preceding cell, but the environment surrounding the target cell differs from the environment surrounding the preceding cell. (Page 6, Paragraph 2, Equivalency determination)

**Regarding Claim 3:**

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**Cobb discloses** The method of claim 2, wherein if the previously calculated solution for the preceding cell is used as the initial input to the iterative process, the iterative process only operates on features within a border region within the target cell that can be affected by the environment surrounding the target cell, and ignores features within the target cell that are not located within the border region. **(Page 6, Paragraph 2, Windowed Area)**

**Regarding Claim 4:**

**Cobb discloses** The method of claim 1, wherein the target cell is similar to the preceding cell if the layout of the target cell matches the layout of the preceding cell, and the environment surrounding the target cell matches the environment surrounding the preceding cell. **(Page 6, Paragraph 12, Equivalency Determination)**

**Regarding Claim 5:**

**Cobb discloses** The method of claim 1, wherein the simulated layout corresponds to a manufactured result for the layout. **(Page 6, Paragraph 1, IC Mask Layout)**

**Regarding Claim 6:**

**Cobb discloses** The method of claim 1, wherein the target cell is similar to the preceding cell if the layout of the target cell differs from the layout of the preceding cell by less than a pre-specified amount. **(Page 5, Top Paragraph, Pre-compensates resultant)**

**Regarding Claim 7:**

**Cobb discloses** The method of claim 1, wherein if the previously calculated solution for the preceding cell is used as the initial input for the iterative process, and if the iterative process produces a simulation result that differs significantly from the desired layout, the method further comprises restarting the iterative process using the desired layout instead of the previously calculated solution as the initial input to the iterative process. **(Page 5, Top Paragraph, Figure 5, Elements 506-514)**

**Regarding Claim 8:**

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**Cobb discloses** The method of claim 1, wherein the iterative process involves repeatedly:

simulating a current solution for the target cell to produce a current simulated layout; **(Page 5, Top Paragraph, Corrections. Figure 1 and 5)**

if the current simulated layout differs from the desired layout by less than a pre-specified amount, accepting the current solution as a final solution for the target cell; **(Page 5, Top Paragraph, Pre-compensates resultant.**

**Figure 1, Elements 108-114 and Figure 5, Elements 506-514)**

and otherwise, correcting the current solution to compensate for differences between the current simulated layout and the desired layout. **(Page 5, Top Paragraph. Figure 1 and 5)**

**Regarding Claim 9:**

**Cobb discloses** The method of claim 1, wherein prior to considering the target cell, the method further comprises:

receiving a specification for the layout of the integrated circuit; **(Page 5, Top Paragraph, Areas)**

and dividing the layout into a plurality of cells, whereby each cell can be independently subjected to the iterative process. **(Page 5, Top Paragraph, Unique Areas)**

**Regarding Claim 10:**

**Cobb discloses** The method of claim 1, wherein the iterative process performs model-based optical proximity correction (OPC). **(Abstract)**

**Regarding Claims 11-20 and 21-30:**

**See rejection for Claims 1-10.**

**Regarding Claims 31 - 33:**

**See rejection for Claim 1.**

**Regarding Claim 34:**

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See rejection for Claim 2.

Regarding Claim 35:

See rejection for Claim 6.

**Conclusion**

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. All Claims are rejected.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saif A. Alhija whose telephone number is (571) 272-8635. The examiner can normally be reached on M-F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

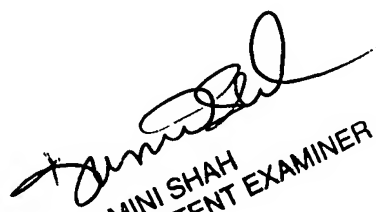


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAA

July 21, 2007



KAMINI SHAH  
SUPERVISORY PATENT EXAMINER